

(0.78 mg/ml) against *C. albicans* when compared to outdoor-grown plants (6.25 mg/ml). The current findings highlight the potential for use of tissue cultured *B. volubilis* as alternatives to outdoor grown plants in traditional medicines.

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### Evaluation of anti-inflammatory and antibacterial activity of two plants belonging to family Myrtaceae and Rosaceae to combat acne vulgaris

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Acne vulgaris is a most common skin disorder where *Propionibacterium acnes* colonization contribute to the etiology of the disease. Bacterial resistance is an ongoing problem in the treatment of acne. Therefore, an agent which can inhibit *P. acnes* growth and suppress the inflammatory response will provide promising benefits for acne. The present study was done to test the potential of two plants from family Myrtaceae (P1) and Rosaceae (P2) to combat acne vulgaris. The crude ethanol extracts of leaves of both the plants were used in the various assays. The antibacterial activity was evaluated against pathogenic *Propionibacterium acnes* using broth dilution method. Plant; P1 inhibited the bacterial growth with MIC of 62.5–31.3 µg/ml whereas Plant; P2 showed a lower MIC of 15.7 µg/ml. Both the plants were tested for cytotoxicity on Mouse melanocytes B16-F10 cells and Human monocytic U937 cells. Plant; P1 showed moderate to low toxicity with fifty percent viability of cells (EC<sub>50</sub>) at concentrations of 60.00 µg/ml and 209.02 µg/ml on B16-F10 and U937 cells respectively. Whereas Plant; P2 showed a comparatively higher toxicity with EC<sub>50</sub> values of 48.23 µg/ml and 25.07 µg/ml on B16-F10 and U937 cells respectively. The antibacterial activity was confirmed by Transmission electron microscopy. The electron micrographs showed damage of cell wall of *P. acnes* treated with the plant extracts, leakage of intracellular contents and abnormal changes. The antioxidant activity was detected by DPPH radical scavenging method and EC<sub>50</sub> (substrate concentration to produce 50% reduction) was found to be 0.89 µg/ml for P1 and 2.34 µg/ml for P2. *P. acnes* induce monocytes to secrete pro-inflammatory cytokines and play an important role in pathogenesis of inflammatory acne. The anti-inflammatory activity of extracts on secretion of cytokine IL-8 was evaluated using ELIZA. The synergistic study of aqueous extracts of both the plants was done to evaluate the Fraction inhibitory concentration (FIC) and was found to be below 5.

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### Extracts of plant species used traditionally or discovered by wide screening can be used to treat production animal infections by blowflies, worms and fungi

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Three examples of application of plant extracts on animal productivity that delivered different patentable products are presented. Some plant species used traditionally to treat myiasis in animals had activities based on two mechanisms that could explain

their traditional use. Extracts had good antimicrobial activities against wound infecting organisms releasing volatile compounds that attract blowflies to wounds. The extracts also had an effect on the metamorphosis of the blowflies. There is a potential of using these extracts to treat infected animals or to reduce fly populations. Plant species used traditionally to treat helminth infections inhibited the hatching of eggs and development of larvae of *Haemonchus strongoloides* one of the most important nematodes affecting sheep production in the world. Although the concentrations affecting the helminth was relatively high, these extracts could be effective in controlling nematodes because the organisms occur in the gut and to have an effect the extracts do not have to be parentally available. *Aspergillus fumigatus* is an important poultry pathogen that infects the lungs of many avian species. Seven tree species that had good activity against *Cryptococcus neoformans* were selected from the Phytomedicine Programme database. A crude leaf extract of *Loxostylus alata* had the same level of protection as amphotericin B on growth, pathology and presence of fungi in lungs of chicks infected with *A. fumigatus*. The results demonstrate the potential use of plant extracts to enhance animal productivity once aspects such as availability of plant material, cost of delivering the product, safety and marketing has been considered.

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### Antimutagenic potential of *Combretum microphyllum* methanol leaf extract

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Determination of antimutagenic potential of plant extracts is an important step in the discovery of new effective cancer chemopreventive agents. The potential antimutagenic effects of *Combretum microphyllum* leaf methanol extracts were investigated using the Ames test (*Salmonella typhimurium* TA98, TA100 and TA102), cytokinesis-block micronucleus-cytome assay and comet assay (single cell gel electrophoresis). This species had antimutagenic effects ranging from 10% to more than 30% in the Ames test, prevented micronuclei induction by up to 65.9%, chromosomal rearrangements (51.9%) and gene amplification by 86.1% in the micronucleus/cytome assay. In the comet assay, there was clearly a dose dependent decrease in comet tail length. Taking into account that chromosomal biomarkers of genomic instability are relevant to cancer and that genotoxicity involving gene mutations, chromosomal aberrations and rearrangements and DNA strand breakages play a major role in cancer initiation, *C. microphyllum* has potential in cancer prevention as it inhibits genotoxic end-points. Bioassay-guided fractionation of the crude methanol leaf extract, using the Ames test (*S. typhimurium* TA98, TA100 and TA102) as an indicator of antimutagenicity, led to the isolation of three compounds. Chemical characterization of the compounds and assaying for further activity in the other assays is in progress.

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